

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
17 January 2002 (17.01.2002)

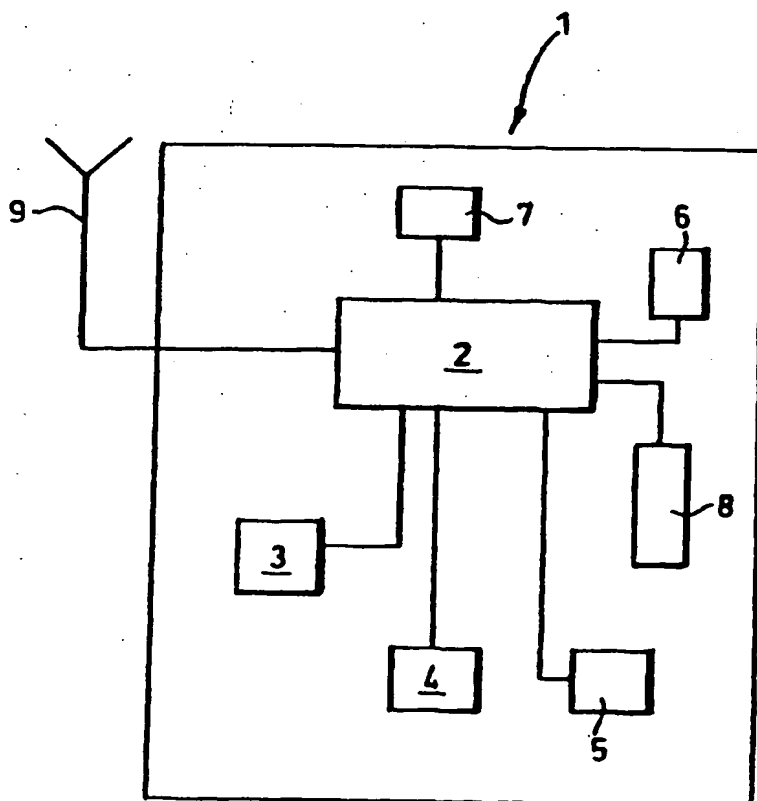
PCT

(10) International Publication Number
WO 02/05583 A1

- (51) International Patent Classification⁷: H04Q 7/32, (72) Inventor; and
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- (21) International Application Number: PCT/GB01/02649
- (22) International Filing Date: 14 June 2001 (14.06.2001) (74) Agents: PRATT, David, Martin et al.; Withers & Rogers,
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- (25) Filing Language: English (81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK,
SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA,
ZW.
- (26) Publication Language: English
- (30) Priority Data: 0016945.8 10 July 2000 (10.07.2000) GB (84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
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(54) Title: MOBILE COMMUNICATIONS SYSTEM



(57) Abstract: A communications system comprises a transceiver (2) for telecommunication with a remote base transceiver station of a mobile telecommunications network, and first and second SIM card holders (3, 4). Each holder (3, 4) is operatively associated with the transceiver (2) so that respective associated SIM cards can be simultaneously registered with the telecommunications network.

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patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*

MOBILE COMMUNICATIONS SYSTEM

This invention relates to a communications system, and in particular to a mobile telecommunications system.

A commercial mobile telecommunications service typically utilises a cellular network structure in which users communicate using mobile station terminal equipment (mobile handsets) and base transceiver stations located in the cells. In a modern system such as the GSM system (global system for mobile communications), each mobile handset contains a subscriber identity module (SIM). The SIM is a smart card, and has a computer memory chip permanently installed thereupon. The SIM is a crucial element of the GSM system, in that it contains user specific information such as the identity of the user (the telephone number of the user), information to ensure that calls are billed to the user, information to enable the user identity to be verified by the network, information to provide security invoice encryption, and telephone numbers saved as short dial codes that are specific to the user. The SIM can also be used to contain other information defined by the network. In fact, the SIM is the only part of a mobile telephone which is truly personal to the user. Conventionally, a SIM card is installed semi-permanently within the handset of a mobile phone.

The present invention provides a communications system comprising a transceiver for telecommunication with a remote base transceiver station of a mobile telecommunications network, and first and second SIM card holders, each of which is operatively associated with the transceiver so that respective associated SIM cards can simultaneously be registered with the telecommunications network.

Advantageously, the system further comprises first and second SIM cards positioned respectively in the first and second SIM card holders. In this fashion, the transceiver may handle calls for either of the two SIM cards, but obviously only one call can be in progress at a time.

In a preferred embodiment, the SIM card holders are physically connected to the transceiver. Alternatively, the SIM card holders are wirelessly connected to the transceiver, for example via Bluetooth transceivers.

- 5 In a preferred embodiment, the transceiver and a Bluetooth master unit are operatively associated in a first entity, the first SIM card holder and a first Bluetooth slave unit are operatively associated in a second entity, and the second SIM card holder and a second Bluetooth slave unit are operatively associated in a third entity.
- 10 Advantageously, the system further comprises one or more further entities, each of which has a further SIM card holder operatively associated with a further Bluetooth slave unit. In this way, a plurality of SIM cards may be simultaneously registered with the network via the single transceiver in the first entity, and each SIM card is able to make and receive calls, always subject to the limitation that no more than one call can
- 15 be in progress at a time.

Advantageously, each entity other than the first entity is provided with a battery, and preferably said each entity is provided with a microphone and a loudspeaker.

- 20 In a preferred embodiment, the transceiver of the first entity is provided with multiple instances of a TCP/IP protocol stack. Alternatively, the transceiver of the first entity is set up to use different ports from a single TCP/IP stack to multiplex/de-multiplex data from different users associated with each entity other than a first entity.
- 25 The invention will now be described in greater detail, by way of example, with reference to the drawing, the single figure of which is a schematic representation of a communications device constructed in accordance with the invention.

- Referring to the drawing, a communications device 1 includes a GSM engine 2, first and second SIM card slots 3 and 4, a microphone 5, a loudspeaker 6, a keypad 7 and a display 8. The GSM engine 2 communicates with a base transceiver station (not shown) via an antenna 9. The GSM engine 2 is a GSM transceiver, and contains all the
- 30

functionality of a mobile phone handset apart from the items specifically mentioned above.

5 The communications device 1 described above could be mounted in a motor vehicle, in which case a first SIM card (not shown) could be semi-permanently installed by the user into the slot 3. A second SIM card (not shown) would, in this case, be semi-permanently installed in the slot 4 by, for example, the vehicle manufacturer or (where a motor vehicle is a leased vehicle) by the fleet manager. The second SIM card would allow a motor vehicle to report diagnostic information about the vehicle
10 automatically without any input from the user. This SIM card would also allow communication between the vehicle and, say, the police in the event that the vehicle is stolen. Such information would allow the vehicle to be disabled or tracked by the police, thereby facilitating vehicle recovery. Both SIM cards are simultaneously registered with the telecommunications network, and the arrangement is such that either
15 SIM card can make or receive calls. Obviously, if one of the SIM cards is in use, the other SIM card cannot be used until the call associated with said one SIM card is terminated.

20 The communications device 1 could also be configured as a mobile phone handset, in which case the two SIM cards could be used for different purposes. For example, the first SIM card could be used for business calls, and the second SIM card could be used for personal calls. In this case, the user's company would be charged for calls made by the first SIM card, and the user would be charged personally for calls made by the second SIM card. Another possibility would be for two members of the same family to
25 use the same mobile phone handset, each having a respective SIM card for separate calling and charging purposes.

In a modified form of communications device (not shown) the SIM card slots 3 and 4 would be positioned a short distance away from the device, either together in a separate
30 entity or as to two separate entities. In either case, a respective SIM card would be positioned in each of the slots 3 and 4, and each SIM card would communicate wirelessly with the communications device 1. For example, the communications

device 1 could be provided with a Bluetooth master unit, and a corresponding Bluetooth slave unit could be provided in the entity containing the two slots 3 and 4, or in each of the entities containing the separate SIM card slots.

- 5 Bluetooth is a computing and telecommunications industry specification that describes how mobile phones, computers and personal digital assistants (PDAs) can easily interconnect with each other and with home and business telephones using a short-range wireless connection. Each Bluetooth device is equipped with a microchip transceiver which transmits and receives in the previously-unused band of 2.45 GHz
- 10 that is available globally with some variation of bandwidth in different countries. In addition to data, up to three voice channels are available. Each Bluetooth device has a unique 48-bit address from the IEEE 802 standard, and connections can be point-to-point or multi-point. The maximum range of Bluetooth is 10 m, and data can be exchanged at a rate of 1 megabits per second (up to 2 Mbps in the second generation
- 15 of the technology). A frequency hop scheme allows devices to communicate even in areas where is a great deal of electromagnetic interference. Built-in encryption and verification is provided in the Bluetooth specification.

- Bluetooth provides a mechanism for creating short-range networks (piconets) which
- 20 dynamically change as users enter and leave the range of a Bluetooth master unit. Each piconet can support up to seven simultaneous devices (one master unit and six slave units)

- In a further modification of this system, the communications device 1 could be used as
- 25 a GSM pay phone unit. In this case, users of the system would each be provided with a SIM entity which would incorporate a standard GSM SIM card connected to a Bluetooth slave unit. In this case, the communications device 1 (a GSM entity) would also include a Bluetooth master unit for communication with the Bluetooth slave unit of any SIM entity within the range of Bluetooth communications. Any such SIM entity
- 30 would be registered with the GSM network, though obviously only one of these entity could make or receive a call at any time. Each SIM entity would be provided with a small battery (either a primary cell or a rechargeable battery), a headset, (or a

microphone and a loudspeaker) a display and a keypad. A SIM entity could, therefore, be as cheap to manufacture as a simple pocket calculator.

In order to make the system more vandalproof, the GSM pay phone unit could be located in a secure area, and need not be visible/accessible to the user. An advantage of this type of GSM pay phone system is that it is cheap to install. This would be particularly important in third world countries where it is often easier to roll-out a cellular network than to install a wired pay phone system. Normally, the cost of equipping the population with a large number of mobile phone handsets would be prohibitive in such third world countries. The use of the GSM pay phone system described above would, however, allow a rapid deployment of pay phone points which make use of a cellular infrastructure without complex investment in infrastructure (beyond the cellular infrastructure itself). Extremely low cost equipment could then be supplied to members of the population to enable them to make calls from the "pay phones". In this case, the use of pre-paid SIM cards would obviate billing problems. Another advantage of using this system in third world countries is that the GSM pay phone units themselves could be solar or battery powered, and so could be positioned practically anywhere.

The system of the invention utilising a GSM entity and a plurality of SIM entities would permit multiple users of a general packet radio service (GPRS) to be registered with a single GSM engine, in such a manner that all may connect, for example, to the same wireless Internet provider. GPRS is a packet-based wireless communication service that permits continuous connection to the Internet for mobile phone and computer users. GPRS has the advantage of being cheaper than circuit-switched services, since communication channels are used on a shared-use, as-packets-are-needed basis rather than dedicated only to one user at a time. The system of the invention can be adapted for GPRS use by providing the GSM engine either with multiple instances of a TCP/IP protocol stack, or by using different ports from a single TCP/IP stack to multiplex/de-multiplex data from different users to the wireless IP provider. In this way, all the users can, for example, surf the web using a single GSM engine. The number of GPRS packets in either direction is managed by

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the network in such a way that the total bandwidth remains within the capacity of the GSM engine and the network. In this way, multiple users can undertake packet data exchange on a GPRS enabled GSM engine, without any of the users being aware of the other users.

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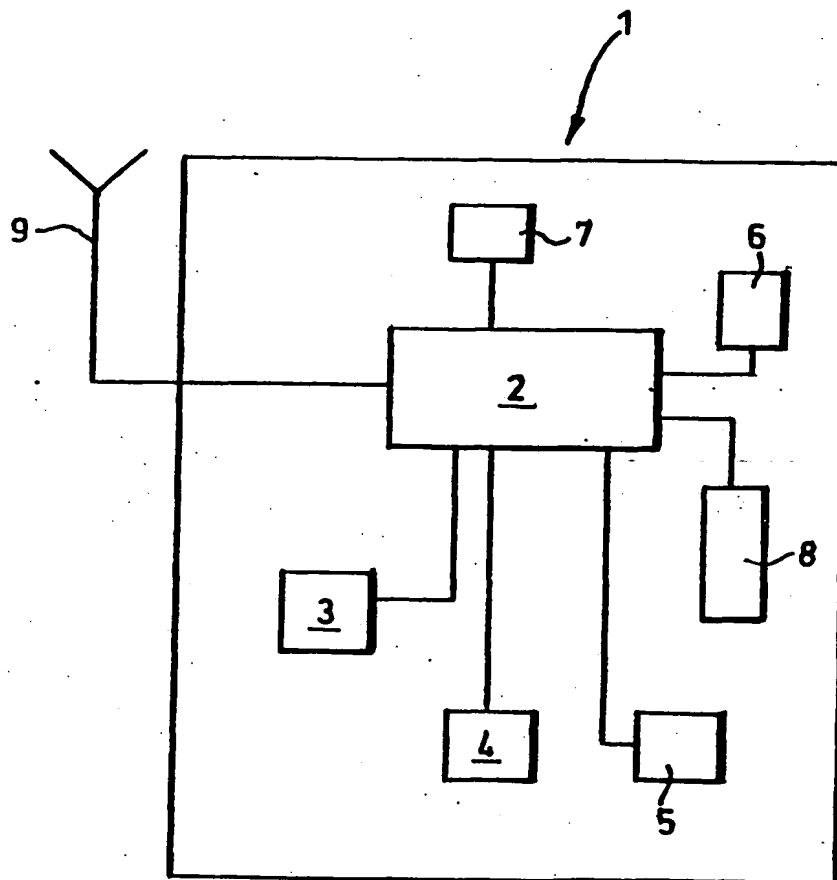
It will be apparent that the communications device described above provides additional functionality when compared with a standard mobile phone handset.

Claims

1. A communications system comprising a transceiver for telecommunication with a remote base transceiver station of a mobile telecommunications network, and
5 first and second SIM card holders, each of which is operatively associated with the transceiver so that respective associated SIM cards can be simultaneously registered with the telecommunications network.
2. A system as claimed in claim 1, further comprising first and second SIM cards
10 respectively positioned in the first and second SIM card holders.
3. A system as claimed in claim 1 or claim 2, wherein the SIM card holders are physically connected to the transceiver.
- 15 4. A system as claimed in claim 1 or claim 2, wherein the SIM card holders are wirelessly connected to the transceiver.
5. A system as claimed in claim 4, wherein the SIM card holders are connected to the transceiver via Bluetooth transceivers.
20
6. A system as claimed in claim 5, wherein the transceiver and a Bluetooth master unit are operatively associated in a first entity, the first SIM card holder and a first Bluetooth slave unit are operatively associated in a second entity and the second SIM card holder and a second Bluetooth slave unit are operatively associated in a third
25 entity.
7. A system as claimed in claim 6, further comprising one or more further entities, each of which has a further SIM card holder operatively associated with a further Bluetooth slave unit.
30
8. A system as claimed in claim 6 or claim 7, wherein each entity other than the first entity is provided with a battery.

9. A system as claimed in claim 8, wherein said each entity is provided with a display and a keypad.
10. A system as claimed in claim 8 or claim 9, wherein said each entity is provided with a microphone and a loudspeaker.
11. A system as claimed in any one of claims 6 to 10, wherein the transceiver of the first entity is provided with multiple instances of a TCP/IP protocol stack.
- 10 12. A system as claimed in any one of claims 6 to 10, wherein the transceiver of the first entity is set up to use different ports from a single TCP/IP stack to multiplex/de-multiplex data from different users associated with each entity other than the first entity.

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INTERNATIONAL SEARCH REPORT

International Application No.

PC1748 01/02649

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/32 H04L12/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

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Y	column 6, line 3 - line 11 column 9, line 18 - line 44	4-12
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A	US 5 553 314 A (GRUBE GARY W ET AL) 3 September 1996 (1996-09-03) column 2, line 53 - column 3, line 23; figure 1	4-12
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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- *8* document member of the same patent family

Date of the actual completion of the international search

24 October 2001

Date of mailing of the international search report

30/10/2001

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INTERNATIONAL SEARCH REPORT

Intern 1st Application No

PC170B 01/02649

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Information on patent family members

International Application No

PCT/JP 01/02649

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